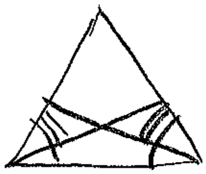
Honors Geometry Midterm Review Proofs

Name Key

Use figure 1 for #1,2, 3, & 4.

1. Given: m∠SRT = m∠STR; m∠3 = m∠4
   Prove: m∠1 = m∠2



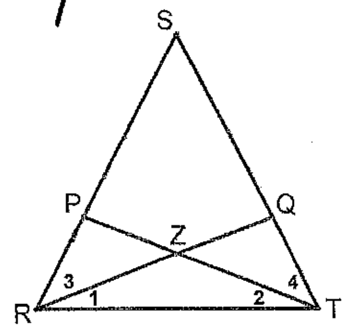


Figure 1

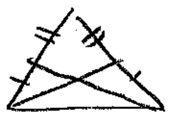
① m∠SRT = m∠STR, m∠3 = m∠4 ① Given

② m∠SRT = m∠3 + m∠1, m∠STR = m∠4 + m∠2 ② A.A.P.

③ m∠3 + m∠1 = m∠4 + m∠2 ③ Subst.

④ m∠1 = m∠2 ④ Subtr

2. Given: RP = QT; PS = QS
   Prove: RS = TS

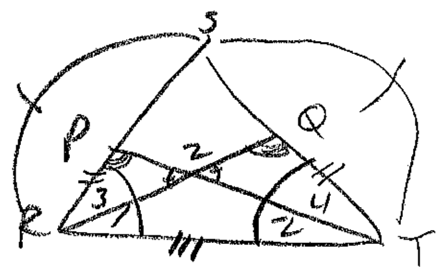


① RP = QT PS = QS ① Given

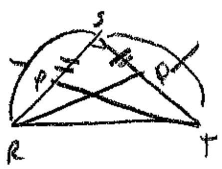
② RP + PS = QT + QS ② Add

③ RP + PS = RS, QT + QS = TS ③ SAP

④ RS = TS ④ Subst.



3. Given: $\overline{RS} \cong \overline{TS}$; $\overline{PS} \cong \overline{QS}$
   Prove: $\angle TPS \cong \angle RQS$



① $\overline{RS} \cong \overline{TS}$ $\overline{PS} \cong \overline{QS}$ ① Given

② ∠S ≅ ∠S ② Reflexive

③ △TPS ≅ △RPS ③ SAS

④ ∠TPS ≅ ∠RPS ④ CPCTC

4. Given: $\overline{RS} \cong \overline{TS}$; $\overline{RP} \cong \overline{TQ}$
   Prove: $\overline{PZ} \cong \overline{QZ}$

① $\overline{RS} \cong \overline{TS}$ $\overline{RP} \cong \overline{TQ}$ ① Given

② ∠SRT ≅ ∠STR ② Base ∠s Thm

③ $\overline{RT} \cong \overline{RT}$ ③ Reflexive

④ △PRT ≅ △QTR ④ SAS

⑤ ∠RPT ≅ ∠TQR ⑤ CPCTC

⑥ ∠PZR ≅ ∠QZT ⑥ Vert. ∠s ≅

⑦ △PZR ≅ △QZT ⑦ AAS

⑧ $\overline{PZ} \cong \overline{QZ}$ ⑧ CPCTC

5. Given: $\overline{AB} \cong \overline{CD}$; $\overline{AB} \parallel \overline{CD}$

Prove: $\overline{AD} \cong \overline{CB}$

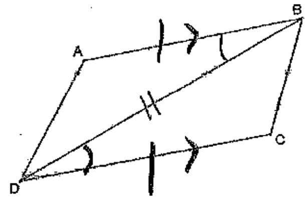


Figure 2

① ~	① Given
② ∠ABD ≅ ∠CDB	② Alt. int. ∠s thm
③ $\overline{BD} \cong \overline{BD}$	③ Reflexive
④ △ABD ≅ △CDB	④ SAS
⑤ $\overline{AD} \cong \overline{CB}$	⑤ CPCTC

6. Given: $\overline{AC}$ bisects ∠BAD, ∠1 ≅ ∠3
Prove: $\overline{BC} \parallel \overline{AD}$

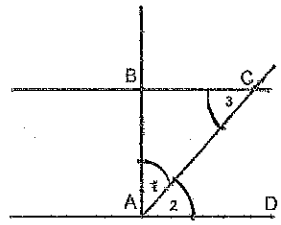


Figure 3

① $\overline{AC}$ bisects ∠BAD; ∠1 ≅ ∠3	① Given
② ∠3 ≅ ∠1	② symmetric
③ ∠1 ≅ ∠2	③ def of ∠ Bis.
④ ∠3 ≅ ∠2	④ Transitive
⑤ $\overline{BC} \parallel \overline{AD}$	⑤ Alt. Int. ∠s Converse

7. Given: $\overline{AC}$ is a median of △ABD, AB > AD
Prove: m∠1 > m∠2

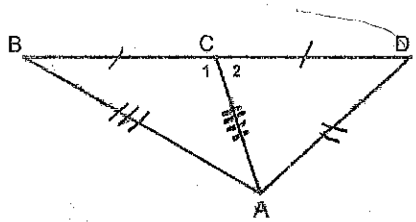


Figure 4

① $\overline{AC}$ is the median AB > AD	① Given
② $\overline{AC} \cong \overline{AC}$	② Ref
③ $\overline{BC} \cong \overline{DC}$	③ def of Median
④ m∠1 > m∠2	④ Hinge Thm Converse

Coordinate proof
Given: △OEF is a right triangle, M is the midpoint of $\overline{EF}$
Prove: EM = FM = OM

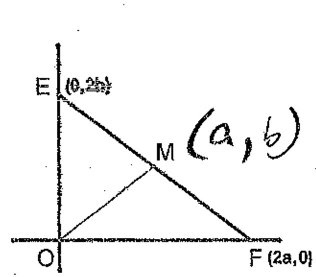


Figure 5

$$EM = \sqrt{(a-0)^2 + (b-2b)^2}$$
$$\sqrt{a^2+b^2}$$

$$FM = \sqrt{(2a-a)^2 + (0-b)^2}$$
$$\sqrt{a^2+b^2}$$

EM = FM = OM

$$OM = \sqrt{(a-0)^2 + (b-0)^2}$$
$$\sqrt{a^2+b^2}$$